

IN THE CLAIMS:

1. (Currently Amended) A mobile communication system employing a plurality of digital optical links, said system comprising:

a base station (BS) controller for managing overall control within said mobile communication system, said BS controller coupled to a base transceiver system (BTS) via a first E1 or T1E1/T1 link;

a compact base transceiver system (BTS) controller coupled to said BS controller via a second E1 or T1E1/T1 link for managing the channel capacity of a plurality of compact base transceiver systems (BTSSs); and

a plurality of optical fiber links coupled to said BTS controller at one end via an optical coupling and the plurality of said compact BTSSs at the other end; and, wherein —

said plurality of compact base transceiver systems (BTSSs) have ~~having~~ a plurality of optical transponders arranged in spaced ~~space~~ relation with each other along each of said optical fiber links, said optical transponders being operative for receiving, along the respective optical fiber link, an ~~an~~ up-link ~~optical~~ signal traveling away from said BTS controller in a forward direction, the forward optical signal ~~at one~~ frequency to be retransmitted as a down-link signal if at one frequency, and for amplifying, if at another frequency, said up-link ~~the received optical signal at another frequency and transmitting the amplified~~ signal to another ~~other~~ compact BTS along said optical fiber link in said forward direction.

2. (Currently Amended) The system of Claim 1, wherein said down-link signal corresponds to the radio frequency (RF) of said compact BTS, and wherein said amplified ~~up-link~~ signal is forwarded to the ~~an~~ RF portion of said another ~~other~~ compact BTS disposed along said optical fiber link in said forward direction.

3. (Currently Amended) The system of Claim 1, wherein said compact BTS controller comprises:

a link control section for dividing incoming signals received from said BS controller according to a link, a frequency assignment and a sector information extracted from said incoming signal, and for transferring thesaid divided signals to the plurality of said optical fiber links;

a link device for matching signals exchanged between one of the pluralsaid compact BTSs and a mobile station in communication with thesaid one compact BTS;

a conversion section coupled to said link device for converting ana forward IF (intermediate frequency) signal propagating in said forward direction into a digital signal and for converting ana reverse IF signal propagating in said reverse direction into an analog signal; and,

a multiplexing section coupled to said conversion sector for multiplexing saidthe forward digital signals into a plurality of channels and for demultiplexing signals from one of said optical fiber links to be transferred to said link control section.

4. (Currently Amended) The system of Claim 3, further comprising an optical converting section coupled between said multiplexing section and one of said optical fiber links for converting from/to an electrical signal to/from an optical signal and vice versa.

5. (Currently Amended) The system of Claim 4, wherein said optical converting section further comprisedcomprising a coupler for transmitting thesaid converted optical signals at a particular frequency to one of said optical fiber links, and for transmitting optical signals received from one of said

optical fiber links to said optical converting section.

6. (Original) The system of Claim 1, wherein the number of said optical fiber links is limited by the capacity of said BS controller.

7. (Currently Amended) The system of Claim 1, wherein each one of said plurality of optical transponder comprises:

a first optic coupler for dividing forward optical signals inputted from a previous optical transponder according to wavelength received therein;

a first photoelectric converter for photoelectrically converting said forward optical signals divided by said first optical coupler;

a high frequency divider for dividing electric signals photoelectrically converted by said first photoelectric converter into a first signal and a second signal;

a demultiplexer for demultiplexing said first signal and for outputting said demultiplexed first signal to an~~the~~ RF portion of at~~the~~ current compact BTS;

a first electro-optical converter for electro-optically converting said second signal; and,

a second optical coupler for dividing said converted second signal according to the wavelength received therein and forwarding the~~said~~ converted second signal to a next optical transponder.

8. (Currently Amended) The system of Claim 7, further comprising:

a second photoelectric converter for photoelectrically converting ~~the~~ signals received from said second optical coupler;

a multiplexer for multiplexing ~~the~~ electric signals received from said second photoelectric

converter; and,

a second electro-optical converter for electro-optically converting thesaid multiplexed electric signals and for forwarding saidthe converted, multiplexed signals to said previous optical transponder via said first optical coupler.

9. (New) A method for providing a mobile communication system employing a plurality of digital optical links, said method comprising the acts of:

providing a base station (BS) controller for managing overall control within said mobile communication system, said BS controller coupled to a base transceiver system (BTS) via a first E1 or T1 link;

providing a compact base transceiver system (BTS) controller coupled to said BS controller via a second E1 or T1 link for managing the channel capacity of a plurality of compact base transceiver systems (BTSS); and

providing a plurality of optical fiber links coupled to said BTS controller at one end via an optical coupling and the plurality of said compact BTSSs at the other end; wherein said plurality of compact base transceiver systems (BTSSs) have a plurality of optical transponders arranged in spaced relation with each other along each of said optical fiber links, said optical transponders being operative for receiving, along the respective optical fiber link, an optical signal traveling away from said BTS controller in a forward direction, the forward optical signal to be retransmitted as a down-link signal if at one frequency, and for amplifying, if at another frequency, the received optical signal and transmitting the amplified signal to another compact BTS along said optical fiber link in said forward direction.